States and the State of the Art for Health Care Quality Measurement and Reporting:
An Environmental Scan

Prepared for the

Rhode Island Health Care Quality Steering Committee
Rhode Island Department of Health
Cannon Building
Three Capitol Hill
Providence, RI 02908-5097

Prepared by

Harvey Zimmerman
Spectrum Research Services, Inc.

September 1999

Table of Contents

States and the State of the Art for Health Care Quality Measurement and Reporting:
An Environmental Scan

I. Introduction

The search for quality indicators in health care is not new. Providers and patients, alike, have always been concerned about what procedures work and whether some practitioners have better outcomes than others.

The search for quality has extended across the broad spectrum of research in health and medicine. In some areas, it has moved farther and faster than others. For example, clinical trials, which are intended to demonstrate the safety and effectiveness of prescription drugs, have attained a high level of sophistication by using randomized double blind designs. But they achieve their high levels of precision by carefully selecting their subjects to minimize diversity.

Since outcomes for diverse patients with diverse medical needs in diverse situations is the hallmark of the quality indicators we seek, we should not expect to approach the scientific elegance of a clinical trial. But there is a lot that we can do short of this. To understand this, one need only look at all the attempts at measuring quality that are occurring right now. The first impression upon beginning an investigation of current practice is that the number of approaches to measuring health care quality and patient satisfaction is endless. Further investigation reveals that some programs that seem superficially different have a great deal in common. There is indeed a great deal of overlap in the different approaches used in different places.

Table 1 will provide a flavor of the diversity of attempts to measure quality that are under way now. A number of states, government agencies, and professional

organizations are developing quality indicators. In addition, some organizations such the Joint Commission on Accreditation of Healthcare Organizations (JCAHO).

Table 1

Types of Hospital Quality Measurement and Reporting Systems

Cleveland Health Quality Choice (CHQC) Program

Utah Hospital Quality Care Indicators

Colorado Hospital Association

Georgia Health Care Data Reports

New York Cardiac Surgery Reporting System

Maryland Quality Indicator Project

ORYX Plus Performance Measures (JCAHO)

California Hospital Outcomes Project

Pennsylvania Health Care Cost Containment Council

Missouri ShowMe Buyer's Guide

HCFA Medicare Hospital Information Report

America's Best Hospitals
US News & World Report

Consumer's Guide to Hospitals
Consumers' CHECKBOOK

healthcarereportcards.com
Health Care Report Cards, Inc.

and the Health Care Financing Administration (HCFA) have (or have had) nationwide systems. In addition to this, a number of proprietary systems are emerging such as the reports on "America's Best Hospitals," and the "Health Care Report Cards" series that is being posted on the Internet.

II. Approaches to Measuring Quality of Health Care

A careful review of the many initiatives to measure quality reveals that, although each project has its own distinctive characteristics, many of these are variations on a few common themes. Most of the quality measurement and reporting projects focus on one or more of these four areas to gauge quality for hospitals. For example, mortality rates or length of stay are used by many projects ranging from HCFA's short-lived attempt to publish in-hospital mortality rates for Medicare patients to the invasive cardiac treatment databases in New York, Pennsylvania, and northern New England.

Utilization rates for discharges such as those indicating C-sections, low birthweight, hysterectomy, pediatric asthma, and so forth are reported, sometimes hospital by hospital such as in Utah, and at other times by region of the state as in Vermont.

Adverse events include such indications as wound infection rates, unscheduled readmissions, and obstetrical complications. Maryland's Quality Indicators include a varied selection of these as do other state reporting systems such as that of Utah.

In addition, some states such as California look at accreditation parameters from other databases. If you call up the California quality web site (www.healthscope.org), it

will hyperlink you to other web sites such as JCAHO (www.jcaho.org) that report on aspects of quality.

These conceptual models are summarized in Table 2. With this overlap, it is

---

Table 2

What is Quality and How Is It Measured?

Quality is indicated by mortality rates

HCFA Medicare Mortality Rate by Hospital

Quality is indicated by inhospital length of stay

Pennsylvania Coronary Artery Bypass Graft Surgery
New York Cardiac Surgery Reporting System

Quality is indicated by utilization rates

Vermont Program for Quality in Health Care

Quality is indicated by rates of adverse events

Maryland Quality Indicator Project

Quality is indicated by accreditation parameters

California Consumer Health Scope - Pacific Business Group on Health
Hospital Accreditation - Link to JCAHO
Quality checklist - questions to ask (board-certified physicians, patient outcomes)
Hospital report cards - C-sections
Transplants
Heart attacks
Heart surgery
Newborn rehospitalization

---

easier to gain an understanding of what other people are doing by focusing on some good examples of the various approaches.

III. Specific Indicators of Mortality and LOS Rates

One of the early attempts to measure hospital quality was pioneered in Cleveland. Beginning in 1989, the Greater Cleveland Hospital Association, Cleveland Tomorrow (50 large companies), Health Action Council of Northeast Ohio (1,600 medium and large companies) and the Council of Smaller Enterprises (12,900 small businesses) undertook a collaborative effort to measure and compare patient outcomes and patient satisfaction as indicators of quality, to share this information, and to combine it with cost information to try to determine the value that was being produced by area hospitals (four counties around Cleveland). The heavy involvement of business makes this project unique.

The project looks at three types of indicators-- mortality rates, length of stay, and patient satisfaction. Table 3 shows typical examples of the indicators used for mortality, length of stay and patient satisfaction by the Cleveland project. For reporting mortality rates and LOS, a composite set of diagnoses are aggregated for medical, surgical, intensive care and obstetrical types of care. A risk adjustment system called APACHE III adjusts for severity.

The project uses two types of reports, a technical report for trained users and a summary report for the public. The summary report gives individual hospitals' performance using a five-part scale. The performance ranks are: 1.) above predicted at the $p<.01$ level; 2.)above predicted at the $p<.05$ level; 3.) within the predicted range (average); 4.) below predicted at the $p<.05$ level; and 5.) below predicted at the $p<.01$ level.

Table 3

Cleveland Health Quality Choice

State or Area	Examples	Risk Adjustment
Cleveland	Mortality Medical (heart attack, congestive heart failure, stroke, pneumonia, COPD, and GI hemorrhage) Intensive care . . .	Severity-adjusted APACHE III
	Length of Stay General surgical (CABG, major blood vessel repair, lung resection, lower bowel resection, spine surgery, repair of fracture & hip replacement, prostatectomy, hysterectomy) Intensive care . . .	Severity-adjusted APACHE III
	Patient Satisfaction Obstetrics Medical & Surgical . . . Total Process 41 Questions about 1. admissions 2. daily care 3. information 4. nursing 5. physician care 6. ancillary services 7. housekeeping 8. living arrangements 9. discharge 10. billing 11. food quality	

Global
1. Return
2. Brag about
3. Recommend

Satisfaction measures include a Global Satisfaction section and a Patient Judgment System. The Global Satisfaction section is a composite of three questions asking patients whether they would return for treatment in the future, whether they would brag about the hospital, and whether they would recommend it to friends and family. The Patient Judgment System has 41 questions in 11 areas as is listed in Table 3. Separate samples are used for medical/surgical care and for obstetrics.

In general, outcome data are based on 12 months experience, random records are reabstracted for quality control, hospitals have an opportunity to analyze test data and make corrections, and 600 patient satisfaction surveys per hospital are used.

IV. Broad Gauge Indicators of Health Care Quality

Specific indicators characterize the Cleveland approach. The Maryland Quality Indicator Project uses broad gauge indicators. For example, while the Cleveland project reports mortality and length of stay for a narrowly-defined diagnosis such as lower bowel resection, the Maryland project reports surgical wound infections for all inpatient surgical procedures. This project is especially interesting because Rhode Island hospitals (along with over 50 other multi-hospital groups) have participated in it.

The project began in 1985 as a pilot project of seven Maryland hospitals. The goal is to monitor patient care quality and identify opportunities for improvement. The data system includes 15 inpatient and ambulatory outcomes-based clinical indicators. Indicators of care for pediatrics and long-term care are being pilot tested, as well as some

utilization indicators. Data are reported quarterly. Table 4 gives examples of the data set.

The down side to this system is that aggregate data are not reported publicly. Individual hospitals may release their own data.

Table 4

Maryland Quality Indicator Project

State or Area	Examples	Risk Adjustment
Maryland	Hospital Acquired Infections Surgical Wound Infections Inpatient Mortality Neonatal Mortality Perioperative Mortality Cesarean Sections Unscheduled Readmissions . . . Unscheduled Returns to ED Within 72 Hours Registered Patients in ED > 6 Hours . . . Unplanned Departures (Adult- Psychiatric) Unplanned Departures (Adolescent- Psychiatric) Transfers to Acute Care (Adolescent- Psychiatric) . . . Unscheduled returns to OR (Pediatric) Inpatient Admissions for Pediatric Asthma Inpatient Admissions for Pediatric Gastroenteritis . . .	None

---

Utah has the reputation of being a leader in collecting and reporting quality of care data. It uses a quality indicator system that was developed by the Agency for Health Care Policy and Research (AHCPR) as part of the the Healthcare Cost and Utilization Project (HCUP-3). Utah has been collecting and reporting data since 1992. The data

collected include outcome data, utilization data and data on access to care. While some categories such as low birthweights and admissions for pediatric asthma are more indicative of care outside the hospital than care in the hospital, the indicators provide a good overview of the health care system from the hospital perspective.

Since the data needs are basically met by hospital discharge data which is routinely collected in most states, this is a system that could be adopted quickly and at low cost. Since 19 states use the HCUP-3 indicators, this gives a basis for comparison with others. Examples of the data set are given in Table 5.

Obvious gaps in this reporting system include outpatient services and some specialty hospitals such as psychiatric and rehabilitation hospitals.

Table 5

Utah Quality Indicators

State or Area	Examples	Risk Adjustment
Utah	<u>Outcomes & Utilization</u>	
	Obstetrical complications	Simple rates/
	Wound infections	standardized rates
	C-section deliveries	
	Adverse effects/iatrogenic complications	
	Laminectomy/spinal fusion	
	Laparoscopic cholectectomy	
	Coronary artery bypass graft	
	Low birthweight	
	Pediatric asthma	
	Diabetes long-term complications	

Table 6 provides more detail for this data set. There is some risk adjustment in this system by reporting both simple rates and standardized rates. As one can see, the

types of indicators measured include outcomes as reflected by mortality rates, coded complications such as wound infections and surgical complications, utilization rates that may suggest overly aggressive treatment or measure the adoption of new techniques, and some indicators reflecting access to primary care in which hospitalization may be avoidable. For inpatient services, indicators touch on a broad cross-section of services and special patient populations such as pediatric, obstetric, and geriatric as well as acute medical and surgical. Psychiatric and rehabilitation are missing, as was mentioned above, as well as outpatient.

Table 6

Healthcare Cost and Utilization Project Indicators

State or Area	Examples	Risk Adjustment
Healthcare Cost and Utilization Project (HCUP) - AHCPR	<u>Outcomes</u> Inhospital mortality Hysterectomy Laminectomy/spinal fusion Cholecystectomy Transurethal prostatectomy Hip replacement Knee replacement <u>Coded Complications</u> Obstetrical complications Wound infection Adverse effects and iatrogenic complications <u>Surgical Complications</u> Pulmonary compromise after major surgery Acute MI after major surgery Gastrointestinal hemorrhage/ulceration after major surgery Thrombosis/pulmonary embolism after surgery/vascular procedure Mechanical complication due to device, implant, graft	Simple rates/ standardized rates

Urinary tract infection after major surgery
Pneumonia after major surgery/vascular procedure

Utilization

Obstetrical
C-section
Vaginal birth after C-section
Incidental appendectomy among elderly
Hysterectomy
Laminectomy/spinal fusion
Transurethral prostatectomy
Radical prostatectomy
Laparoscopic prostatectomy
Coronary artery bypass graft

Access to Primary Care

Obstetrical - low or very low birthweight
Pediatric - asthma
Preventable influenza & pneumonia among elderly
Cerebrovascular disease among non-elderly
Diabetes complications
Surgical - perforated appendix

V. Quality Indicators for Specific Services

Some states have taken a more focused approach on developing quality care indicators for hospitals. A good example of this approach is found in Pennsylvania. The Pennsylvania Health Care Cost Containment Council is the agency in that state that collects and analyzes quality data. The best known set of quality indicators there is the Coronary Artery Bypass Graft Surgery system. Data on mortality, length of stay and costs are reported by hospitals, cardiac surgeons, and health plans. Data have been reported since 1992. Over that time period, risk-adjustment methodology has been improved, and more data on health plans has been added.

Pennsylvania has moved from cardiac bypass operations to include other types of care including ambulatory and inpatient surgery, drug-related hospitalizations and C-section deliveries.

This state goes beyond Cleveland in reporting methods. Not only do they provide technical reports and reports for the general public, but they also report on the Internet.

Table 7

Pennsylvania Health Quality Indicators

State or Area	Examples	Risk Adjustment
Pennsylvania Health Care Cost Containment Council	Coronary Artery Bypass Graft Surgery Ambulatory vs. Inpatient Surgery Drug-related hospitalizations C-section deliveries	Own risk adjustment methodology

---

VI. Quality Measurement by Accreditation Organizations

Another example of health care quality measurement and reporting is the ORYX Plus system used by the Joint Commission on Accreditation of Healthcare Organizations. JCAHO is in the process of adding measures of outcome to their accreditation process. Currently, they offer 32 validated measures in seven different areas, from which hospitals must choose and report on 10 (in the near future). Here are examples from each of the seven areas. They range from complications (stroke, heart attack or cardiac arrest) within two days of receiving anesthesia to low birthweight infants to care recorded in the medical record to measurement of levels of prescribed drugs in the blood stream.

Hospitals must report some of these data to JCAHO anyway. If one can get consensus on a uniform data set, then use of these data would help control costs and reporting burdens of the hospitals.

Table 8

JCAHO ORYX Plus Hospital Indicators

State or Area	Examples	Risk Adjustment
Joint Commission on Accreditation of Healthcare Organizations	Perioperative measures Complications from anesthesia Mortality after anesthesia Obstetrical C-section deliveries Vaginal birth after C-section . . . Cardiovascular LOS surgery to discharge - CABG LOS surgery to discharge - PTCA . . . Trauma Blood pressure, pulse, respir. rate recorded hourly/3 hours If intracranial injury, Glasgow coma scale recorded hourly . . . Oncology Tumor stage indicated for lung, colon/rectum, breast CA Estrogen receptor analysis for females with Stage I or greater breast CA . . . Patient management Creatinine clearance measured or est. for patients 65+ Insulin dependent diabetes--demonstrate self glucose monitoring and insulin administration or follow-up . . . Other Surgical site infection--selected procedures Ventilated patients who develop pneumonia . . .	Own risk adjustment methodology

VII. Reactions to Health Care Quality Measurement

The reactions of hospital personnel and others to the many attempts to measure and report quality were also sought. There is invariably apprehension and concern at the start of these projects. Sometimes the fears are realized; sometimes not.

First, there are some common problems. When the data first become available, there is a tendency to treat all differences in performance measures equally. For example, when the cardiac outcomes were reported for New York state, the media tended to rank all the hospitals and base decisions of who was better on the ranking. Of course, some statistics are so close together that they should be considered equivalent. This is a problem that gets corrected fairly quickly with a little patience and education for the reader on what constitutes a meaningful difference.

The reason that these projects have continued and others are beginning is that some very informative data on outcomes are being reported. Cardiac outcome reporting systems have been some of the best examples. For example, when the data were first reported by the New York state system, some hospitals were surprised to learn at their results were below average. A recent report in the Annals of Thoracic Surgery (1994; 58:1871-76) recounts the experience at St. Peter's Hospital in Buffalo. They report how they first doubted the data, then after reabstracting and editing finally began to look for problems with the operations of the program. The data helped them determine that the problems were with their high-risk patients, then helped them rethink their procedures. Their investigation was successful and their statistics showed greater than average improvements in reported outcomes.

Cleveland is another example of a performance measurement and reporting system that has worked admirably in providing the public with information on the quality of hospital care. For ten years, the system continued with small changes. The Cleveland hospital system is undergoing a series of mergers. Cleveland Clinic has expanded to control a ten-hospital system. It withdrew from participation in the Cleveland Health

Quality Choice System. As a result, the CQCS program is not continuing. The Cleveland experience demonstrates the vulnerability of a voluntary system compared to a system mandated by law.

Another performance reporting system that is reportedly leading to improvements in patient care are the Missouri ShowMe Guides (e.g., Longo et al., JAMA 1997; 278:1579-84). Hospitals are reportedly reacting to reported deficiencies by improving services in obstetrics and outpatient departments.

VIII. Conclusion

There is sufficient experience in other geographical areas to demonstrate that healthcare quality can be measured and reported in ways that are useful to consumers as well as health care professionals. The basic questions to be answered are 1.) what are the characteristics that we want in a health care quality measurement system, and 2.) how do we choose the indicators for the system. While this paper has looked primarily at the second question, answers to the first question are implicit in the choices that have been made by other areas.

Table 9 provides a context in which the first question can be explored. First, one answer to the question: "What is healthcare quality?" has been suggested by the CONQUEST system. (See http://www.ahcpr.gov/qual/conquest/conqfact.htm for information about this system.) Aspects of quality that these researchers agreed upon are reported in the table. In short, health care that is assessable, effective, safe, accountable, and fair is considered quality health care.

The next question is "Who cares about quality?" There are clearly a number of different interested parties here. The two parties most directly affected are providers and

patients. Purchasers (of health insurance), health plans, and public health agencies are interested since they pay for, contract with, or oversee the provision of health care services, respectively. Hence, all parties are concerned with the quality of clinical services. Selecting a system of quality indicators should recognize their interests and their ability to use different indicators.

Finally, there are a number of qualitative attributes of a quality measurement and reporting system. The ones reported in the table are by no means exhaustive, but are typical of those often mentioned in the literature. The indicators must be credible have an impact on the quality of services; they must be considered important by all who use them; and they must be understood and have a common meaning for all parties. In addition, systems that are viewed as unfair or too costly will not be acceptable. Finally, indicators that encourage improvement in the quality of care in the future will further contribute to the goals of the system.

Table 9

Hospital Quality Measurement and Reporting Systems

The P's and Q's of Health Care Quality Data Systems

What Is Quality of Care?

Accessible	Patients obtain care in a timely way.
Effective	Providers deliver the right care, to the right patient, at the right time, in the right way.
Safe	Consumers have accurate and understandable information about risks and benefits and are protected from unsafe health care services and products.
Accountable	Providers can demonstrate that they deliver effective care. Consumers have reliable and understandable information on the care they receive.

Fair	Patients and doctors have their rights respected. (CONQUEST - Harvard School of Public Health for AHCPR)

Who Cares?

Providers
Patients
Purchasers (Employers)
Plans
Public Health

What Matters?

Credibility
Importance
Understandability
Fairness
Cost
Effects on quality

Appendix:

Summary of Health Quality Measurement & Reporting Efforts in Other States